Application design brainstorm:

REST API design which allows users visit data set. The REST API was chosen because applications can be integrated in different ports. It provides a secure, authenticated form of access to data.

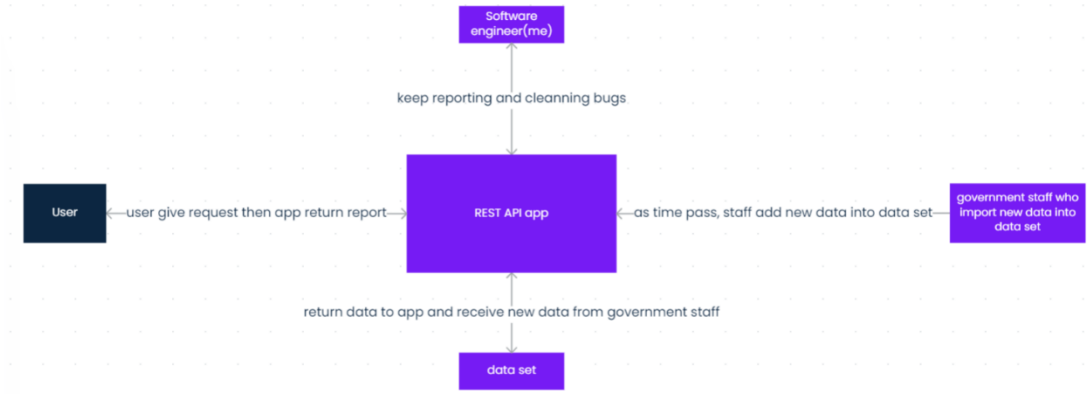

Figure1. Context diagram of whole application circle.

Elicit the requirements:

To combine traditional statistical methods with data science, the government decided to entrust me to design a software to study the changing trends of some data. Include education price (1833-2019), Enrolment distributed by level in UK public education (1854-2019) and Distribution of public expenditure on education in the UK by spenders (1880-2019). The government wants to demonstrate a clean work ethic by making the data transparent. This is why a suitable application is necessary.

Specify the requirements:

1. A design of the REST resources, data format, URIs and the associated HTTP methods
2. Using charts to illustrate the trend.
3. Give statistical information about the data (such as mean, variance).
4. User could choose to analysis specific period.
5. Predict the future trend of data.
6. Give text message about how this time compare with nearby period.
7. Design the application and show the logic between different layers.
8. A login logout system to ensure the security of dataset.
9. Provide automatic bug detection which programmer could fix it quickly.

10. Allow government staff access the data set and make change easily.
11. Provide a window to allow user report bug and give advice.
12. Data set is modifiable.

13. Specify the requirements:

High priority:1, 2, 3, 7,8,9

Could have: 4,5,6,10,12

Low priority: 11

User story:

User story 1:

As a government supervisor who is not financially well off, I would like the app to be available on IOS 9 and newer systems. This way the disadvantaged can also access the software without any barriers.

Solution:

Programmers adapt software to a wider range of systems (pc,mac,ios,android).

User story 2:

As the Government's Head of Information Security, I only want British nationals to have access to our data. I want a national information verification system. This is for data security and correct application.

Solution:

A verification code is generated based on each citizen's information and citizenship is required to access the software.

User story 3:

As a government employee, I would like to see the data set updated annually. This is for the public to have access to the government's financial data in a timely manner.

Solution:

Government personnel add new data to the data set every year. Of course it is also possible to leave the data to the programmers to complete.

User story 4:

As the engineer who maintains the software, I would like to design a feature that allows timely feedback on bugs. This will ensure the experience of the people and the government to use it.

Solution:

Build a continuous integration workflow on GitHub.

User story 5:

As a population, we want the app to provide a way for people with disabilities to read. This will increase the level of trust and goodwill of the people towards the government.

Solution:

Cooperation with health companies and fitting the software with hearing aids.

User story 6:

As a member of the public, I would like to see trends in the data set. It would be better to show this in a graph rather than through a textual summary.

Solution:

Use machine learning to analyse and summarise data.

User story 7:

As an educational investor, I want applications that can predict future trends in data. This way I can confirm the direction of my investments.

Solution:

Use machine learning to analyse and summarise data.

User story 8:

As a citizen, I would like to provide a channel for feedback. This can ease the conflict between the government and the citizens.

Solution:

Provide a feedback window for questions and respond in a timely manner.